ROYAL GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 5.] MAY. [1887.

X.—BOWSTRING HEMP.

This at present is not an article in commercial use; but attention may well be directed to the capabilities of numerous species of *Sansevieria* for producing fibre of great value. Plants of *Sansevieria*, of which there are 10 or 12 species, are very abundant on both the east and west coasts of tropical Africa, which, indeed, may be looked upon as the head-quarters of the genus. One well-known species (*S. zeylanica*) is indigenous to Ceylon; and this and others are found along the Bay of Bengal, extending thence to Java and to the coasts of China. The leaves of these plants are more or less succulent and

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from
EYRE AND SPOTTISWOODE, East Harding Street, Fleet Street, E.C.; or
ADAM AND CHARLES BLACK, 6, North Bridge, Edinburgh; or
HODGES, FIGGIS, & Co., 104, Grafton Street, Dublin.

1887.

Price Twopence.

abound in a very valuable fibre, remarkable alike for fineness, elasticity, and for strength.

Usually the leaves are not more than $1\frac{1}{2}$ to 2 feet long; in some species such as *S. guineensis* and *S. cylindrica* the leaves attain a length of 3 or 4 feet: while in one species, native of tropical Africa, the leaves under favourable circumstances attain a length of 9 feet. In this species, for particulars of which and for samples of its fibre we are indebted to Sir John Kirk, G.C.M.G., Consul-General at Zanzibar, the quality of the fibre is exceptionally good. We have doubtless here a new fibre plant of great value.*

In the treatment of the leaves of *Sansevieria* by machinery, the great drawback hitherto experienced has been their comparatively small size, and the difficulty of cleaning the fibre contained in them in an expeditious and remunerative manner. These circumstances would not obtain in the case of the plant brought into notice by Sir John Kirk. Indeed, for moist tropical climates, as opposed to the dry, hot, and arid districts of Yucatan where the Sisal hemp is grown, this and *S. longiflora* if they are really distinct would be likely to prove of exceptional value as fibre plants.

It may be mentioned that all species of *Sansevieria* prefer a rich moist soil and a comparatively humid climate. They are essentially tropical plants and do not thrive in a temperature less than 60° Fahr. Under such conditions they grow rapidly and establish themselves permanently by means of large spreading fleshy rhizomes or underground stems. It is true they will grow in comparatively dry districts, and even in soils strongly impregnated with salt; but their growth under such circumstances is very slow and the leaves are seldom large enough to produce marketable fibre.

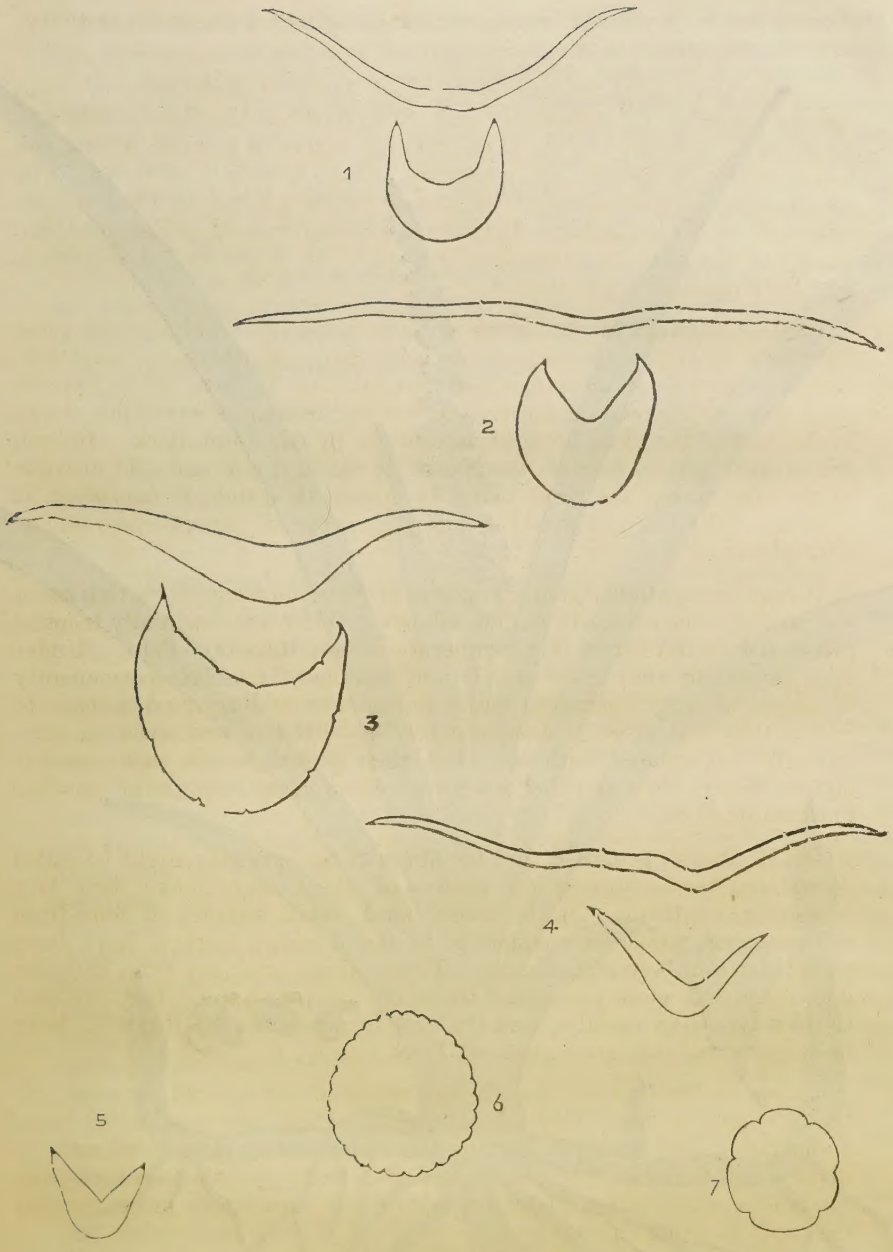
Dr. Roxburgh proposed that the fibres of Sansevierias might be called *Bowstring hemp*, because the natives of the Circars make their best bowstrings of them. On the other hand, small samples of fibre from *S. guineensis*, which have appeared in the London market, have been called African bowstring hemp. These fibres are very firm, hair-like and silky, and closely resemble those of the pine-apple; they are said to take dyes very readily; and the tow is mentioned by Royle to have been converted into good paper at Trichinopoly.

Plants of *Sansevieria* are already abundant in a wild or semi-cultivated state in most tropical countries. They are capable of being propagated very readily. Usually the underground stem or rhizome is divided and planted; but plants may also be raised from seed, or from the leaves, which latter, planted whole or cut into small pieces, readily take root in moist situations.

---

* As to the identification of this plant Mr. Baker remarks as follows:—

"We have a specimen in flower from Buchanan, 'Shire highlands, Zambesia. Yields a most excellent fibre.' So far as can be judged by a rough sketch Sir John Kirk's is the same plant; and there seems no reason why it should not be identical with *S. longiflora*, Sims, in Bot. Mag. t. 2634, of which we have specimens from Guinea, Angola, &c."



Sections of leaves of species of *Sansevieria* :—

1. S. guineensis.
2. S. longiflora.
3. S. Kirkii.
4. S. thyrsiflora.
5. S. zeylanica.
6. S. cylindrica.
7. S. sulcata.

Note.—Where, as in Nos. 1, 2, 3, 4, two sections are given, the lower is from the base of the leaf, and the other exactly across the middle or widest part of the leaf. The sections here represented are nearly the natural size of leaves grown under cultivation at Kew. In the tropics under suitable conditions all the leaves would necessarily grow to a much larger size.

U 51023. 500.—12/87. Wt. 16. E. & S. A 2

Bowstring Hemp.

Sansevieria zeylanica, Willd.

a. Flower laid open. *b*. Seeds.

A full botanical description of the several species of Sansevieria may be found in a monograph of the ASPARAGACEÆ, in the fourteenth volume of the *Journal of the Linnean Society*, pp. 546–550, by Mr. J. G. Baker, F.R.S. The description given in the following notes are contributed by Mr. Baker. The species are restricted to those which are now under cultivation at Kew, and of which specimens of fibre have been prepared and examined. The plants may be seen in the West Transept of the Palm House at Kew ; while the specimens of fibres are in Kew Museum, No. 2.

The species, or well-marked sub-species, of *Sansevieria*,* of which we have living plants at Kew, are seven in number, and they may be readily classified according to their leaves in three groups, as follows :—

I. Leaves comparatively thin and flat :—

1. *S. guineensis.* 2. *S. longiflora.*
3. *S. Kirkii.* 4. *S. thyrsiflora.*

II. Leaves semicircular in transverse section at the middle, deeply hollowed down the face :—

5. *S. zeylanica.*

III. Leaves club-shaped, more like stems than proper leaves :—

6. *S. cylindrica.* 7. *S. sulcata.*

1. Sansevieria guineensis, Willd., is one of the two oldest and best known species. It was first figured and described, long before the days of Linnæus, in the year 1701, by Commelinus in his "Horti Medici Amstelodamensis Rariorum Plantarum Descriptio" (tab. 20), under the name of "Aloe guineensis radice geniculata foliis ex viridi et atro "undulatim variegatis." Linnæus classified it under the genus *Aletris* and so did Jacquin, who figured and carefully described it in 1770 in his Hortus Vindobonensis, vol. I., p. 67, t. 84. It has horny, erect, lanceolate leaves, 3 or 4 feet long, 3 inches broad at the middle, narrowed gradually to an acute apex, not distinctly bordered with red, copiously mottled on both surfaces with broad irregular bands of white. The flowers are in a lax, simple spike, which rises to the same height as the leaves, in clusters of three to six, with a whitish perianth about 2 inches long, of which the six segments are about as long as the cylindrical tube. It is a native of Guinea, from which we have wild specimens gathered by Barter and others. We have it also from Central Africa, collected by Schweinfurth and Grant, and Abyssinia by Beccari, and what is most likely the same from the Zambesi country, gathered by Sir John Kirk in 1860 ; the latter accompanied by a sketch made on the spot, when he was botanist to the Livingstone expedition.

On the Zambesi *S. guineensis* appears to be called "Konje," and Sir John Kirk speaks of it as "yielding a valuable fibre similar to Manila Hemp." It is described as "growing in great abundance in many places keeping to the shade of woods."

Mr. Horne, Director of the Royal Botanic Garden, Pamplemousses, mentions that—

"This plant thrives well in Mauritius in damp marshy places in the "lowlands. I have no doubt that it would thrive well in the wet "uplands."

* As regards the spelling, following the Genera Plantarum, we have adopted Sansevieria, instead of Sanseviera as being the oldest name. Thunberg had it Sansevieria ; Willdenow altered it to Sanseviera, and Kunth followed. Bentham in Genera Plantarum reverted to Sansevieria.

It is widely distributed in the West Indies, and has been grown experimentally for the sake of its fibre at St. Thomas, Jamaica, and Trinidad.

As regards cultural treatment, the following information is taken from notes prepared by the late Director of the Botanical Department, Jamaica, on this and *S. zeylanica* :—

"In the first instance plants may be put out at 3 feet by 3 feet, " which, allowing for roads and paths, would give about 3,000 to the " acre. If the soil is kept well broken and moist, these plants by the " extension of root suckers, will spread in all directions, so that ulti- " mately the whole ground, with the exception of certain paths, which " should be kept permanently open, will be covered with plants. As " regards the time which must elapse between planting out and the " first yield of leaves suitable for fibre, there would appear to be a great " difference of opinion. Plants which I saw at St. Thomas at three " years old were only just ready to be cut; and Baron Eggers, who " had planted them and kept them under close observation during the " whole of that time, was of opinion that Sansevieria plants could not " be depended upon to yield a crop before three or three and a half " years.

"My own experience coincides with this, but necessarily much must " depend upon the nature of the plants when first put out, the character " of the soil, the amount of moisture received, as well as on the system " of cultivation pursued.

"From actual trial tests in India, where one-third of an acre was " cultivated with *Sansevieria zeylanica*, it appears that full grown " leaves of three to three and a half feet long (their actual age is not " mentioned) yielded about 1 lb. of clean fibre for every 40 lbs. of " fresh leaves. That is, the weight of clean dry fibre was at the rate " of $2\frac{1}{2}$ per cent. of the fresh leaves. Dr. Roxburgh calculated that " one acre would yield 1,613 pounds of clean fibre at a gathering, two " of which may be reckoned on yearly, 'in a good soil and a favourable " ' season, after the plants are of a proper age.'

"This would be at the rate of $1\frac{1}{2}$ tons of fibre per acre per annum at " the end of three or three and a half years, of the gross value (at the " rate of 30*l.* per ton) of 45*l.* Whether this return can be depended " upon for the West Indies on an extensive area I am unable to say."

In an experimental trial carried on at Jamaica, 1,185 pounds of green leaves of *S. guineensis* yielded 29 pounds 10 ounces of dry fibre. This was cleaned by machine. The reports of brokers were as follows :—(*a.*) " Value, 18*l.* per ton, mixed fibre partly uncleaned;" (*b.*) "Poorly " cleaned, a good deal of mixture in it, not so strong, value about 25*l.* " per ton ;" (*c.*) "No good in the state sent; it has a lot of bark in it, " and requires more dressing; both ends are clean, but the centre is " dirty. Price, if dressed properly, would be as good as *S. zeylanica*, " viz., 30*l.* per ton."

In September last, His Excellency Sir William Robinson, Governor of Trinidad, forwarded to Kew, samples of fibre of this species, which he stated had been prepared "at the convict depôt at Chaguanas without " the aid of machinery of any kind." The report of Messrs. Ide and Christie on the Trinidad sample was as follows :—

"In point of cleanness and softness of fibre it seems well prepared; " but to compete successfully with Manila hemp it would require to be of " a better colour and of equal if not superior strength. We value it for " rope-making purposes at 20*l.* per ton in London. The small piece of

" Manila fibre which we enclose has a value to-day (Sept. 24, 1886), of " 31*l.* per ton."

A few leaves taken from plants grown at Kew were recently passed through Death's fibre machine, but the result, owing to the smallness of the quantity and the necessity of adjusting the machine to the size of each leaf, was not satisfactory, but it is not devoid of interest. The report of Messrs. Ide and Christie on the sample of fibre submitted to them was as follows :—" Short and only moderate strength. Value 23*l.* per ton. We " reported on fibre from this plant from Trinidad in September last, " when we valued the sample at 20*l.* per ton. The difference now is " due solely to the advance in the price of Sisal hemp."

Of samples of fibre of *S. guineensis*, the Kew Museums contain one specimen machine-cleaned from Jamaica, sent by Mr. D. Morris, 1884, with the following note :—" Leaves 3½ to 4 feet long, broader than *S.* " *zeylanica*, mottled, unarmed, common and easily propagated." A specimen from Trinidad, cleaned by hand, forwarded by Governor Sir William Robinson, and valued by Messrs. Ide and Christie at 20*l.* per ton. Also a leaf, rope, and fibre from S.E. Africa, sent by Mr. T. Baines. A specimen of leaf and fibre from Sir John Kirk appears under the following label, " Maculated Sansevieria, called 'Konje,' " near Lupata, 1860." This is probably identical with *S. guineensis*.

2. **Sansevieria longiflora**, Sims, a native of equatorial Africa, was first figured and described by Dr. Sims in 1826 at tab. 2,634 of the Botanical Magazine. The leaves are very like those of *S. guineensis*, but as grown with us, they are larger, flatter, not so firm in texture, and not invariably blotched with green. The best character by which it may be known from *S. guineensis* is the flower, which is 3½ or 4 inches long, instead of 2 inches. We have specimens in the Herbarium with flowers as large as this from Guinea gathered by Barter and Mann; from the Congo by Prof. C. Smith; from the Zambesi country by Mr. Buchanan; from Angola by the late Mr. Monteiro; from Niam-niam Land by Dr. Schweinfurth. Whether all these are the same species it is impossible to say at present. There is also a large flowered species, called *Sansevieria bracteata*, which was gathered by Dr. Welwitsch in Angola.

In 1879 Sir John Kirk forwarded through the Foreign Office a specimen of fibre from the leaf of a species of *Sansevieria* found growing on the mainland opposite the island of Zanzibar. The specimen sent was the produce of a single leaf, the length of which was 9 feet. The report of Messrs Noble on this specimen was as follows :— " We have carefully examined the fibre from East Africa; it is worth " as a hemp 22*l.* per ton at the present time" (1879).

Recently Sir John Kirk has been good enough to furnish more detailed information as regards the plant yielding this fibre, which leads us to conclude that it is probably *S. longiflora*, Sims. [*See* footnote, p. 2.] In a letter dated 2nd Dec. 1886 he mentions :—

" It grows abundantly near Pangane on the mainland opposite the " island of Zanzibar and in the district between that and Mombasa, and " is used by the natives to yield a long and useful fibre of which I sent " specimens to Kew some years ago.

" The plant has flowered with me at Mbwéni in the island of " Zanzibar, but the soil being too dry and sandy it did not succeed " very well.

" The flowers are on a stalk crowded in a head, not racemose, or in a " spike, as in another species common on the island. Unfortunately " my flowering specimens rotted in drying, so that I have never been

" able to send home the inflorescence for identification. The leaves " which yield the fibre are at first flat and clouded, but after a time the " lower part becomes much elongated, round and grooved on the upper " side, the end only remaining flattened and not so mottled.

" It is a plant worth being introduced to our tropical colonies."

Several plants of this species are growing in the Palm House at Kew, from which it would appear that it is a very free growing and robust species. Some leaves from these plants were lately tested for fibre by means of Death's fibre machine, which yielded at the rate of 1·69 per cent. of clean dry fibre. The report of Messrs Ide and Christie on specimens thus prepared was as follows :—" A very bright, clean, strong " fibre and in every way a most desirable commercial article. It would " compete with the best Sisal Hemp for rope-making purposes. Value " 30*l.* per ton."

There is little doubt that from the robust habit and size which this species is capable of attaining, that it is a most valuable fibre plant. As reported by Sir John Kirk, a single leaf of what we take to be the same species under favourable circumstances attains a height of 9 feet ; and from one such leaf excellent fibre weighing $\frac{3}{4}$ oz. has been produced. This and other examples of fibre are in the Kew Museum, No. 2.

3. Of **Sansevieria Kirkii**, Baker MS., we know the leaves only, but it is evidently a distinct species. It was sent to Kew by Sir John Kirk in October 1881 as a native of the east coast of Africa. We have had it in cultivation at Kew since that time, but so far it has not flowered. The leaf is oblanceolate in shape, and very horny in texture. We have only grown it to a length of 2 feet, with a breadth in the middle of 3 inches. The leaf is dull green, with a distinct brown edge, and is much mottled on both sides. The base is much thicker, and its edges are more incurved than in either of the three other comparatively flat-leaved kinds, and down the back of the lower part of a leaf run about five distinct grooves, a character which distinguishes it readily from *S. guineensis* and *S. longiflora*.

Specimens of fibre prepared from *S. Kirkii*, yielded at the rate of 1·69 per cent. by weight of the green leaf. They were described by Messrs. Ide and Christie as follows :—" Rather stout, but very clean and good " colour : the strength fair. Value 27*l.* per ton."

4. **Sansevieria thyrsiflora**, Thunb., is the species on which the genus Sansevieria was first constituted by Thunberg, in the year 1794. The leaf is nearly flat and does not reach above a foot or a foot and a half in length, and is an inch and a half or two inches broad at the middle, with abundant mottling and a distinct red edge. The flower does not differ from that of *S. guineensis*. It is a native of the eastern parts of Cape Colony. Zeyher gives the place of growth as " Uitenhage, in woods of " Zwartkops and many other places in the east of the colony ; *Kei* of " the Hottentots ; a decoction of the root used for dysentery."

The leaves of this species, growing at Kew, were too small to be tested for fibre.

5. **Sansevieria zeylanica**, Willd., is a very well known and well-marked plant. It is a native of Ceylon, and, long before Linnæus, was figured and described by Royen, Commelinus, and Pluknet. There are 8 or 10 leaves in a tuft and they are semi-circular in transverse section, 1 or 2 feet long, rounded on the back, deeply channelled down the face, $\frac{1}{3}$ or $\frac{1}{2}$ inch thick in the middle, in colour dull green, copiously banded with white, with a distinct red margin. The peduncle and flower spike are each about a foot long, the flowers being rather smaller than in *S. guineensis*, but quite similar in structure. It is well figured in Rédoute's

Liliaceæ tab. 290, and in the Botanical Register, tab. 160, in the year 1816.

In Ceylon this species is known under the Singhalese name of *Neyanda*. It is indigenous to the hotter parts of the island, and the fibre yielded by it is used in numerous ways, such as strings, ropes, mats, and of coarse kind of cloth. In India the plant is known as *Moorva*, *Moorga*, or *Marool*. Sir William Jones, in the Asiastic Researches, Vol. IV., p. 271, mentions *S. zeylanica* under its ancient Sanscrit name of *Moorva*, and he says that: "From the leaves of this "plant the ancient Hindoos obtained a very tough elastic thread called "Maurvi, of which they made bowstrings; and which, for that reason, "was ordained by Menu to form the sacrificial zone of the military "class." Dr. Roxburgh describes the plant as common on the jungly salt soils along the coasts, growing under the bushes, and easily propagated on almost every soil, from the slips which issue in great abundance from the roots, requiring little or no care, and not requiring to be renewed often, if at all, as the plant is perennial. The leaves, when thus cultivated, are from 3 to 4 feet long.

Mr. Horne makes the following note on this plant at Mauritius:—

"Several species of Sansevieria are common here in waste lands, near "the sites of old gardens, and by the road sides. They are not so "readily nor so cheaply established on land as the *aloës vert*. But they "yield a good fibre, which is used for cordage, &c. It has the reputa- "tion of being one of the strongest of fibres. It is known by the name "of *Bowstring hemp* and *Moorva*."

Generally in Ceylon and India the natives prepare fibre from this plant by retting or by simple beating and scraping. Full grown leaves yield at the rate of 7·87 per cent. by weight of the green leaves. Owing to the smallness of the individual leaves they are difficult to clean by machinery, but if it were possible to separate the fibre by a chemical process, this plant would become of great commercial value.

Of samples of *S. zeylanica* fibre the Kew Museums contain one specimen from Ceylon, sent by Dr. G. H. K. Thwaites, under the name of Neyanda fibre; one labelled Moorga or Bowstring hemp, from Jamaica, from Mr. D. Morris, 1884, with the following note attached: —"Longest leaves 3½ to to 4 feet long, narrow, mottled, unarmed, very "common, and very easily propagated either by root, suckers, portions "of the leaf, or seed." There are also samples from the Botanic Garden, Mauritius, sent by Mr. Duncan; from Mysore, obtained from the India Museum, besides rope and twine from Balasore and twine from Cuttack, likewise from the India Museum; a Cingalese whip and nose strings for harnessed bullocks from Kandy, sent by Mr. J. A. Ferdinandus; a sample of paper half stuff from the India Museum; and some fibre, dyed in two colours (red and blue), from Madras, by Dr. Hunter.

Samples of fibre of *S. zeylanica* prepared at Jamaica by machinery, in 1884, were described as follows by London brokers:—(*a.*) "Beautiful "fibre, rather heavy and hard, might be whiter, value very uncertain, "20*l.* to 35*l.* per ton;" (*b.*) "Rather dull in colour and short in "growth, fairly well cleaned. Value about 30*l.* per ton;" (*c.*) "Might "be whiter. It is almost too good for roping purposes. Worth about "30*l.* per ton."

6. Of **Sansevieria cylindrica**, Bojer, an excellent figure and a full account by Sir William Hooker will be found at tab. 5,093 of the Botanical Magazine. It is a most distinct and curious looking plant. The leaves are cylindrical, round in horizontal section, faintly sulcate all

round, especially in the young state, obtuse at the end, arching, reaching when fully developed a length of 3 or 4 feet and a thickness of about an inch. The peduncle is about a foot long; the raceme much longer, with clustered cylindrical flowers just like those of *guineensis* in structure, but only about an inch long. It is spread across South Africa from Zanzibar to Angola. Our Kew plants were received by the Foreign Office from Angola in 1859 under the name of Ifé, and an abundant supply of its fibre and ship's cables and other ropes manufactured from it were shown in the Portuguese Department of the Paris Exhibition in 1858.

In the description attached to the figure of the plant in the Botanical Magazine mentioned above, Sir William Hooker adds the following particulars:—

"About three years ago (that is in 1857) there were received at the "Foreign Office, and transferred to the Admiralty, samples of a "peculiar fibre and cordage under the name of Ifé, said to be derived "from a new plant at the Portuguese Settlement, Angola, west coast "of Africa. These were accompanied by some apparently living "plants, which were placed in the cellars of the Foreign Office, and "by the kindness of our valued friend, G. Lenox-Coningham, Esq., "forwarded to Kew, were they soon recovered, and have since "flowered. The habit of the plant was that of *Sansevieria*, but the "leaves very dark-coloured, and quite terete and solid in the interior, "very unlike any known species of that genus. My duties at the "Paris Exhibition of 1855 led me to the careful investigation of the "vegetable products, and I was there agreeably surprised to find most "extensive samples, in the Portuguese Department, of the raw mate-"rial fibre, and manufactured articles, ship-cables, rope, beautiful "cordage, &c., of the same material, and amongst 'The products of "Angola,' it is thus stated in my 'Report':—'*Fibre* marked, from *San-*"'*sevieria angolensis*, this latter being a MS. name of Dr. Welwitsch "'for a remarkable species of *Sansevieria*, with long, stout, terete "'leaves, which is in cultivation at Kew. The cordage and rope "'made of this plant appear to the eye of excellent quality, whatever "'experience may prove them to be.' Experiments recently made "with this cordage have shown it to be the strongest and best fitted "for deep-sea sounding of any fibre known; indeed this is the less "surprising, seeing that other species of *Sansevieria* (the well-known "*S. zeylanica* and *guineensis*, for example) are cultivated in almost "all tropical countries on account of the strength and durability of the "fibre, under the name of *Bowstring Hemp*."

Of samples of *S. cylindrica* fibre in the Kew Museums there is one specimen from Mauritius, sent by Mr. Duncan; fibre of the Probo and rope and cordage made from it, probably *S. cylindrica*, Sierra Leone, Commodore A. Eardley Wilmot, H.M.S. "Rattlesnake." The following note accompanies this specimen:—"Grows abundantly, can be "easily propagated." There is also a specimen labelled Mokhosi fibre and leaf, probably *S. cylindrica*, used for making cordage, &c., marked S. E. Africa, T. Baines, Esq.

Specimens of fibre prepared from plants growing at Kew, by Death's fibre machine, were described by Messrs. Ide and Christie as follows:—"This is the second best fibre amongst the samples sent, and except "that it does not appear as strong, it is almost equal to *S. Longiflora*. "Value 28*l.* per ton."

7. We have at Kew a dried specimen, as well as living plants, of **S. sulcata**, which appears to be an unpublished name of Boger's. The

plants, probably from East Africa, have never flowered, but in leaf character they are very similar to *S. cylindrica*. Under cultivation they are shorter and more slender, with rather deeper vertical grooves, but no bands or markings. A small sample of the fibre of *S. sulcata* was prepared, and the broker's report upon it was as follows :—"Similar to "fibre of *Furcræa cubensis* and of about equal strength. It is, however, cleaner, and would also compare with Mauritius hemp. Value, "26*l.* per ton."

It is quite possible that other species of *Sansevieria* may be found in tropical Africa, whilst some more more or less distinct may be under cultivation in colonial gardens. The illustrations given on page 3 of this Bulletin will assist in the determination of the species mentioned here. Specimens of any others will be gladly accepted for the Kew collections.

In his synopsis of succulent plants Haworth described briefly a number of additional species of *Sansevieria*, which are now lost to cultivation, so far as we are aware, and of which no figures or dried specimens are known. It is not improbable that there are many more types in existence than we possess materials for individualising or recognising at present. Of plants once in cultivation which Haworth briefly notices, we should be glad of information or specimens of the following: *S. lætevirens*, *S. ensifolia*, *S. glauca*, *S. polyphylla*, *S. grandicuspis*, *S. pumila*, and *S. fulvocincta*.

As regards machinery for the extraction of fibre from these plants the subject is one which lies outside the scope of the *Bulletin*. Machinery is in use in Yucatan and Mauritius for the extraction of fibre from *Agave* and *Furcræa* leaves, and machines are said to be made suitable for the treatment of leaves, of *Sansevieria* and others. We cannot do better, however, than refer to the literature given on this subject in Spon's Encyclopædia. Div. iii., pp. 923–930.

In the chemical extraction of fibres from plants there are several methods under experimental trial, some of which may prove ultimately successful.

D. M.